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Review of the U.S. Commercial Red Snapper Fishery in the Gulf of Mexico

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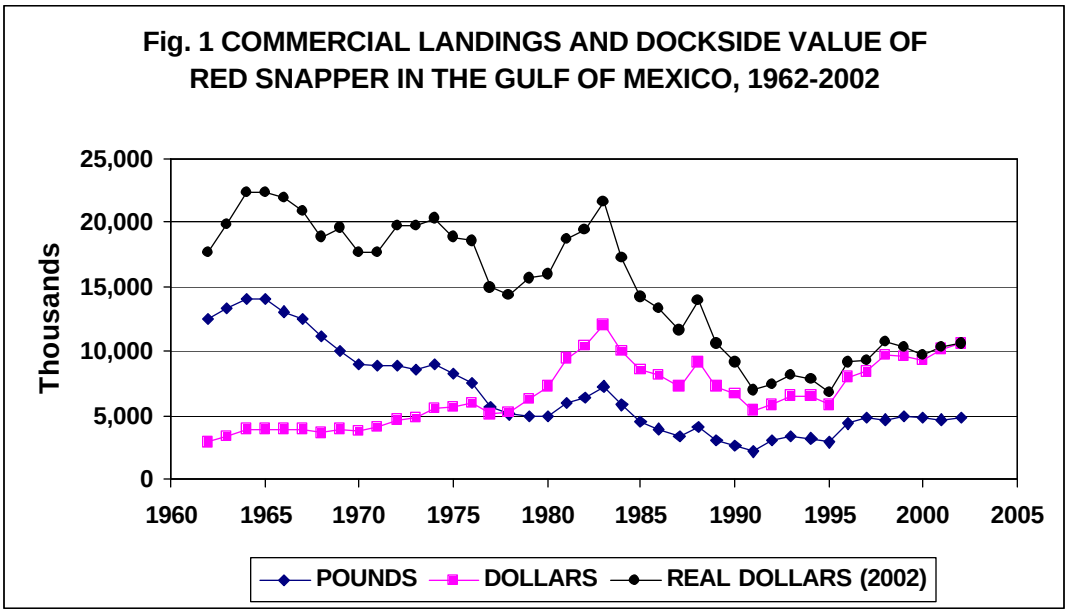
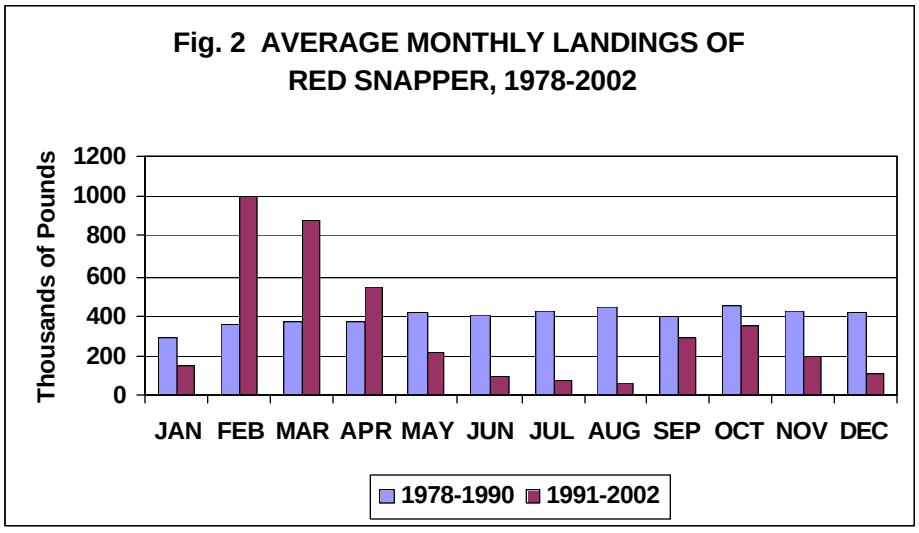
Trends in Landings, Revenues and Prices

Camber (1955), Carpenter (1965), Allen and Tashiro (1976), GMFMC (1981) and Waters (2001) have reviewed the history and status of the red snapper (*Lutjanus campechanus*) fishery. U.S. fishermen have fished commercially for red snappers since the mid 1800s. During the modern period, landings of red snapper exhibited an almost uninterrupted decline between 1965 and 1980, from 14.0 million pounds to 5.0 million pounds (Fig. 1). Landings increased for three consecutive years to 7.3 million pounds in 1983, primarily due to increased catches with bottom longlines, but then dropped to 2.7 million pounds in 1990. The decline in landings was due in part to a decline in catches from foreign fishing grounds (GMFMC 1981) and a decline in the size of the domestic fish population (Goodyear and Phares 1990). Since 1990, the commercial fishery has been managed with annual quotas set at approximately 2.04 million pounds in 1991 and 1992, 3.06 million pounds from 1993-1995 and 4.65 million pounds from 1996 through the present (Waters 2001).

Ex-vessel value received by commercial red snapper fishermen in the Gulf of Mexico increased throughout the 1962-1983 period to a record $12.0 million (Fig. 1). Much of the increase was due to inflation, as measured by the consumer price index for all items and all urban consumers (CPI-U, with 2002 base year). After adjusting for inflation, total ex-vessel value from sales of red snapper generally followed the trend in landings.



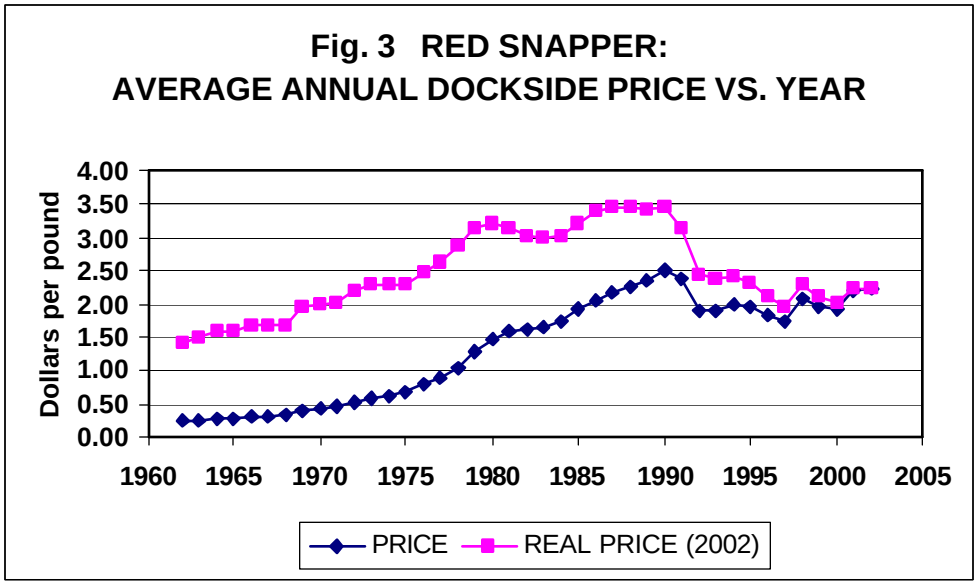
Since 1990, the principal method of managing the commercial fishery for red snapper has been with quotas set at 51% of TAC and seasonal closures after each year's quota was filled. The result has been a race for fish in which fishermen are compelled to fish as quickly as possible to maximize their shares of the overall quota before the season is closed. Seasons have become shorter despite implementation of trip limits in 1992 and larger minimum size limits in 1994 and 1996. The fishing year is now characterized by short periods of intense fishing activity with large quantities of red snapper landed during the open seasons rather than lower levels of activity with landings spread more uniformly throughout the year (Fig. 2). Recently, the fishery has been managed with separate spring (beginning in February) and fall (beginning in October) quotas with 10-day open seasons at the beginning of each month, which has spread industry landings over a greater number of months during the year.

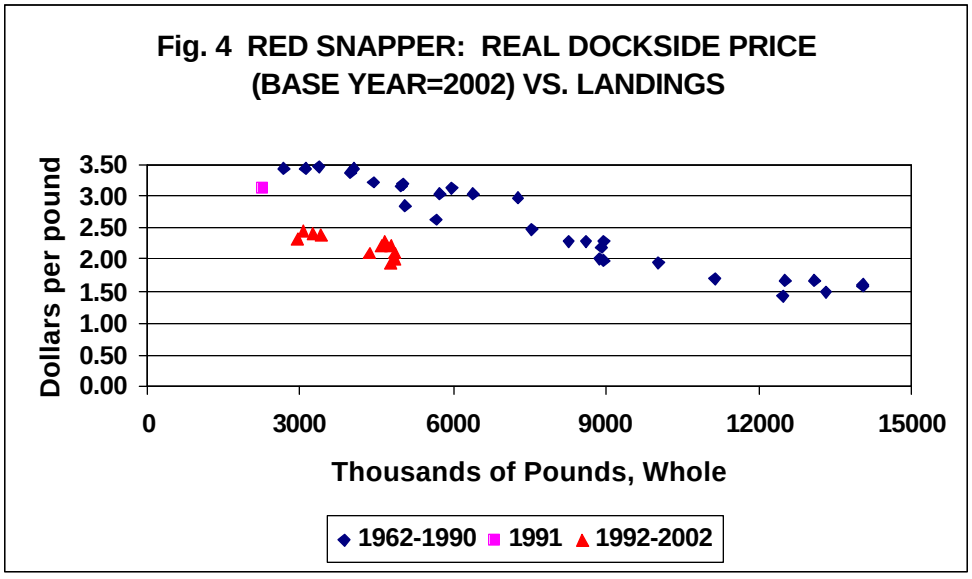


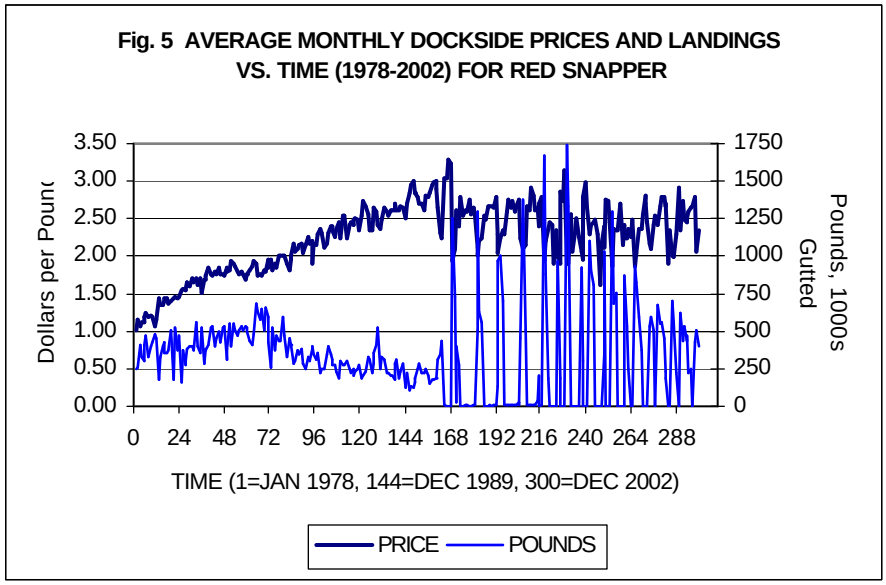
One consequence of quota management has been unusually low dockside prices necessary for the market to absorb the large volumes of fish that are landed during relatively short periods of time. Both nominal and real average annual dockside prices generally increased over time from 1962 through 1990, but since then, prices have declined sharply during each open season both in nominal and real terms (Fig. 3). The magnitude of the effect of quota management on real average annual dockside prices was estimated by Waters (2001) to be approximately $1.14 per pound, as measured as the vertical distance between the price-quantity relationships for the 1962-1990 and 1992-2002 periods (Fig. 4).[1] Figure 5 illustrates the sharp declines in average monthly prices associated with exceptionally large landings during each open season. Average annual and monthly nominal prices were calculated as the ratio of dockside revenues and quantities landed as reported by the NMFS. Real prices were calculated

[1] The price-quantity relationship was estimated with data for 1962-1999. Updated information for 2000-2002 appears to follow the same pattern.

by adjusting nominal prices for inflation with the CPI for all urban consumers and a base year of 2002.







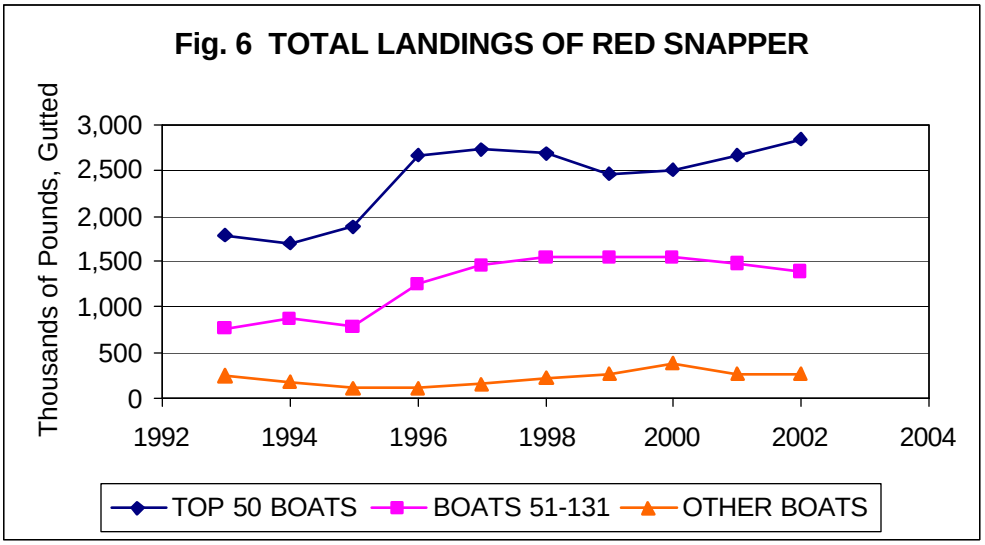
Management of the red snapper fishery has reduced industry revenues in two ways. First, the race for fish caused by quota management caused a downward shift in the entire price-quantity relationship so that fishermen received lower prices for any given quantity of red snapper landed. However, revenues would have declined even without a race for fish. The observation that trends in real dockside prices have followed trends in landings suggests that dockside demand for red snapper is price elastic. Price elasticity of demand refers to the responsiveness of dockside prices to changes in industry landings, and is measured as a movement along the price-quantity demand relationship. When the demand relationship is price elastic, as with the red snapper fishery, regulated reductions in landings result in a less than proportional increase in prices, which causes total revenues earned by fishermen to fall.

Fishing Effort and Productivity

Trip limits were implemented in an effort to slow the race for fish. At the beginning of the 1993 season, 131 boats qualified for red snapper endorsements on their reef fish permits that entitled them to land up to 2000 pounds of red snapper per trip, while boats without endorsements were limited to 200 pounds per trip. The endorsement system remained in effect until formalized into a license limitation system in 1998. Boats with endorsements were granted Class 1 licenses that entitled them to land up to 2000 pounds per trip. Other boats with a history of landing red snapper qualified for Class 2 licenses to land up to 200 pounds per trip. Boats that did not qualify for either type of license are restricted to the recreational bag limit.

NMFS logbook trip reports were examined for measures of fishing effort and productivity in the commercial red snapper fishery. Boats that reported landing red snapper

were classified into three groups. Group 1 consists of the top 50 boats when ranked in terms of annual landings of red snapper. Group 2 consists of the next 81 boats, ranked 51 through 131. Group 3 consists of all other boats that reported landing red snapper, and ranged in number from a high of 505 in 1993 to a low of 323 in 1998, and numbered 357 in 2002. Separate rankings and groupings were performed for each year, 1993-2002, to account for changes in ownership and levels of participation in the red snapper fishery.



The top 50 boats accounted for a disproportionately large share of industry landings of red snapper. Between 1998 and 2002, the top 50 boats averaged 2.6 million pounds of red snapper, or 60% of the industry total (Fig. 6). Boats ranked 51-131 averaged 1.5 million pounds, or 34% of the industry total. Boats in group 3 averaged only 0.28 million pounds, despite their large numbers.

The top 50 boats accomplished this feat by supplying more fishing effort and more productive effort than boats in the other groups. They supplied an average of 1500 trips per year (1998-2002) for red snapper (Fig. 7), or about 30 trips per boat per year (Fig. 8). Boats ranked 51-131 averaged 15 trips per year for red snapper, and other boats landed red snapper on 5 trips per year. The top 50 boats averaged shorter trips (Fig. 9), but carried more people on board each trip (Fig. 10). The top 50 boats averaged 1.8 days per trip and 4.1 persons aboard per trip, whereas boats in group 2 averaged 2.4 days per trip and 3.3 persons aboard, and boats in group 3 averaged 2.9 days per trip and 2.4 persons aboard.

Fig. 7 NUMBER OF TRIPS PER YEAR THAT LANDED RED SNAPPER

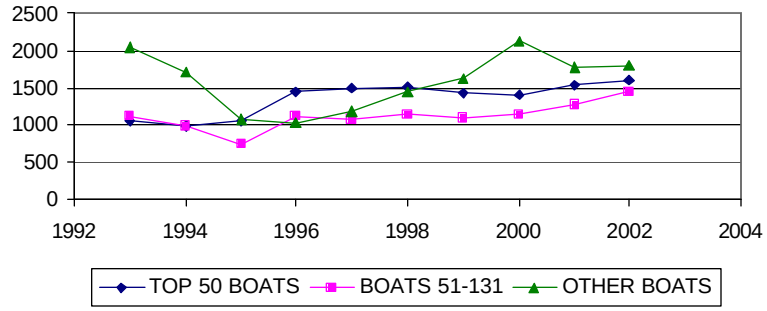


Fig. 8 NUMBER OF TRIPS PER BOAT PER YEAR THAT LANDED RED SNAPPER

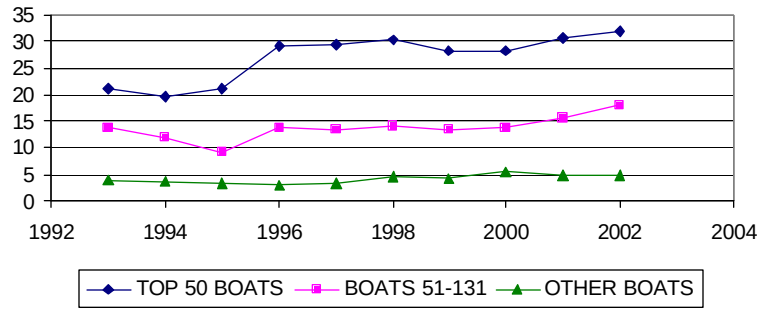
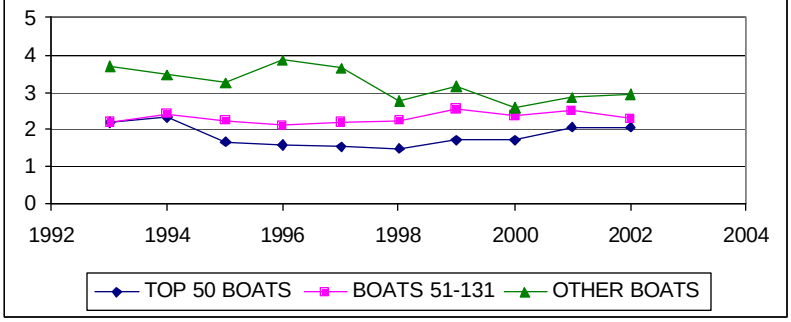
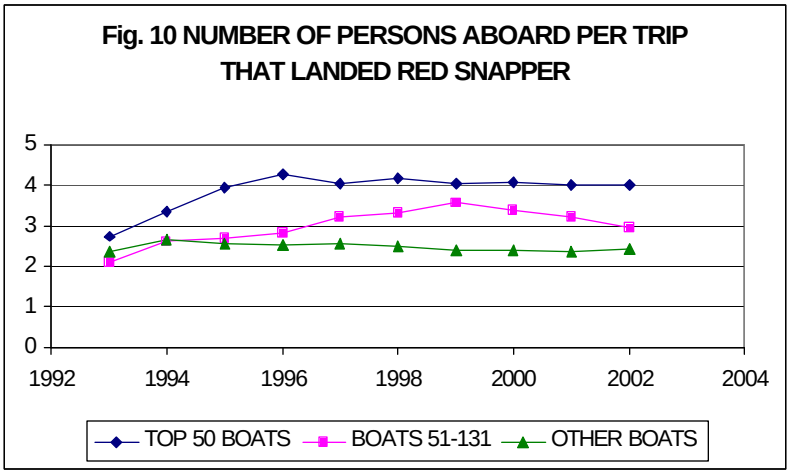
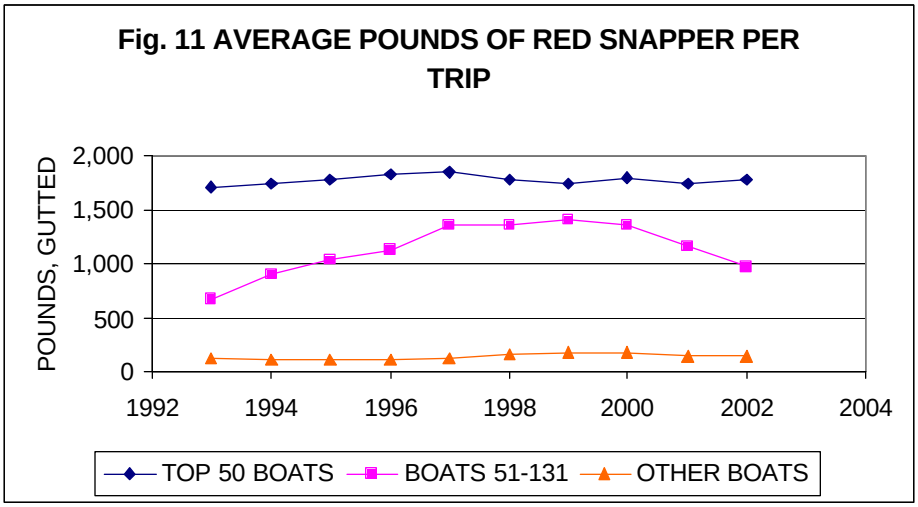


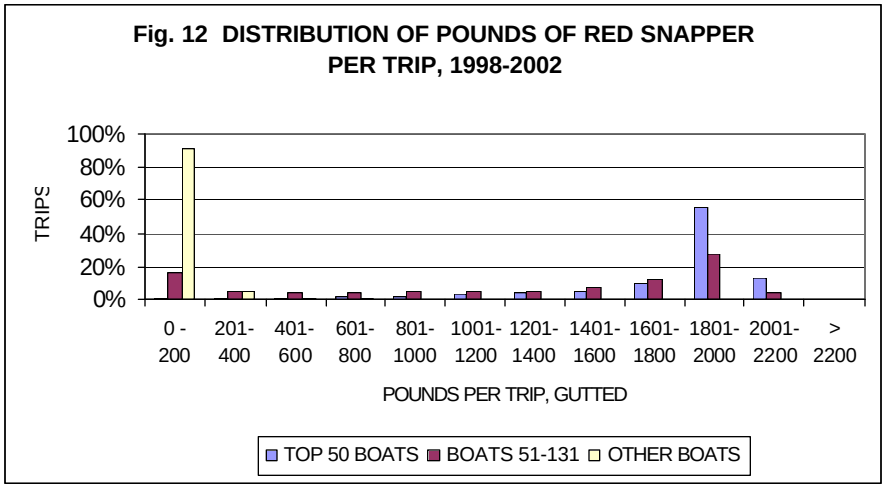
Fig. 9 NUMBER OF DAYS PER TRIP THAT LANDED RED SNAPPER





The result of more productive fishing effort is substantially higher average catch per trip. The top 50 boats averaged 1766 pounds of red snapper per trip from 1998-2002 compared to 1245 pounds per trip for boats ranked 51-131 and 160 pounds per trip for other boats (Fig. 11). Between 1998 and 2002, 79% of red snapper trips by the top 50 boats landed 1600 pounds of red snapper or more, while only 1% of trips resulted in less than 200 pounds of red snapper (Fig. 12). In contrast, 44% of trips by boats in group 2 landed 1600 pounds of red snapper or more, and nearly 17% of their trips landed 200 pounds of red snapper or less. Boats in group 3 did not target red snapper, and 91% of their trips with red snapper resulted in 200 pounds or less of red snapper.





Other Fishing Activities

Trips within each group of boats were classified according to the main species landed on each trip, with main species defined as that which generated the greatest source of revenue. For example, trips were classified as targeting red snapper if revenues from red snapper were greater than revenues from any other individual species.[2]

Boats in groups 1 and 2 fished primarily for red and vermilion snappers. Fishing trips for king mackerel, primarily in July with participation declining through December, was the next most likely alternative for the top 50 boats. The top 50 boats made 75% of their trips for red snapper, 11% for vermilion snapper, 7% for king mackerel, 5% for groupers, and 4% for other species (Fig 13.). Trips by boats in group 2 were slightly less focused on red snapper. Approximately 60% of their trips were for red snapper, 17% for vermilion snapper, 5% for king mackerel, 9% for groupers, and 8% for other species (Fig. 14). Boats in group 3 fished primarily for groupers and other species. Approximately 53% of their trips were for groupers, 14% for red snapper, 9% for vermilion snapper, 5% for king mackerel and 19% for other species (Fig. 15). These data exclude trips for non-reef fish species that were not reported to the NMFS reef fish and coastal migratory pelagics logbook program.

[2] Fishermen do not report prices or revenues in their logbook submissions. Therefore, trip revenues were approximated as reported landings multiplied by average monthly prices that were calculated from general canvass data.

Fig. 13 NUMBER OF TRIPS FOR ALTERNATIVE MAIN SPECIES BY THE TOP 50 BOATS THAT FISHED FOR RED SNAPPER

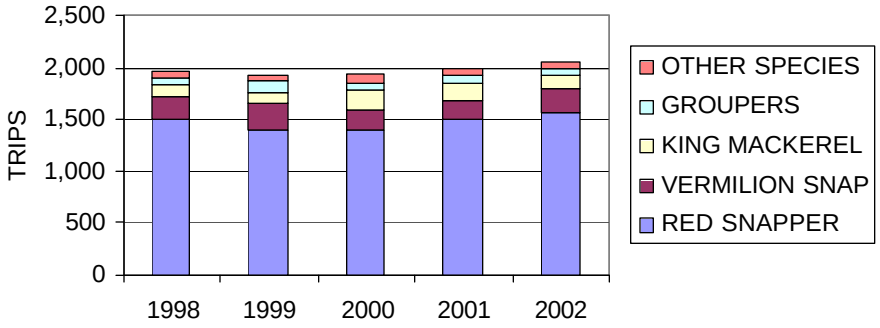


Fig. 14 NUMBER OF TRIPS FOR ALTERNATIVE MAIN SPECIES BY BOATS RANKED 51-131 THAT FISHED FOR RED SNAPPER

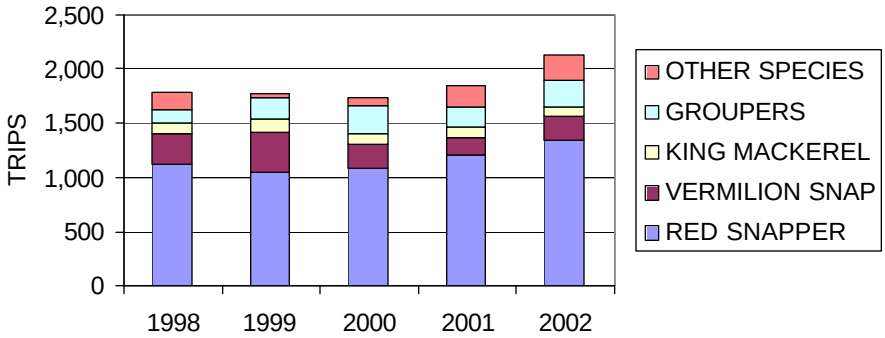
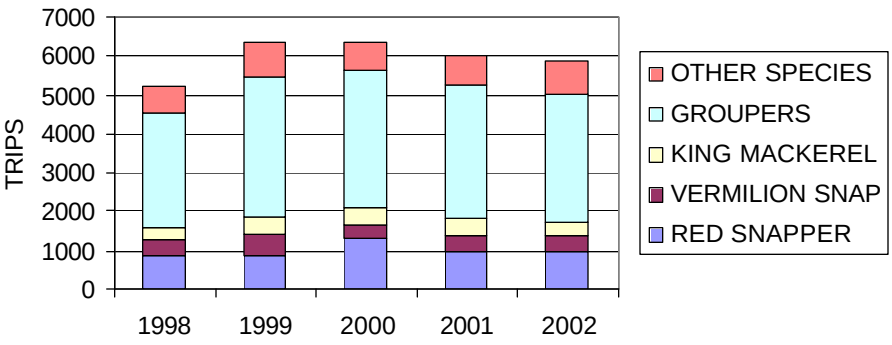


Fig. 15 NUMBER OF TRIPS FOR ALTERNATIVE MAIN SPECIES BY OTHER BOATS THAT FISHED FOR RED SNAPPER



References

Allen, D. M., and J. E. Tashiro. 1976. Status of the U.S. commercial snapper-grouper fishery. Pages 41-76 In Bullis, Harvey R., Jr., and Albert C. Jones, editors. Proceedings: Colloquium on Snapper-Grouper Fishery Resources of the Western Central Atlantic Ocean. University of Florida, Florida Sea Grant Report No. 17.

Camber, C. I. 1955. A survey of the red snapper fishery of the Gulf of Mexico, with special reference to the Campeche Banks. Florida Board of Conservation, Technical Series No. 12, 64p.

Carpenter, J. S. 1965. A review of the Gulf of Mexico red snapper fishery. U.S. Department of the Interior, Bureau of Commercial Fisheries, Circular 208, 35p.

GMFMC (Gulf of Mexico Fishery Management Council). August, 1981. Environmental Impact Statement and Fishery Management Plan for Reef Fish Resources of the Gulf of Mexico. Lincoln Center, Suite 881, 5401 West Kennedy Boulevard, Tampa, FL 33609.

Goodyear, C. P., and P. Phares. 1990. Status of red snapper stocks of the Gulf of Mexico: Report for 1990. Contribution CRD 89/90-05, NOAA, NMFS, SEFC, Miami Laboratory, 75 Virginia Beach Drive, Miami, FL 33149, 72p.

Waters, James R. 2001. Quota management in the commercial red snapper fishery. Marine Resource Economics 16:65-78.